REMARKS

Claims 2, 3, 5, 7-16 and 27-29 are pending in this application, of which claim 2 has been amended. No new claims have been added.

Claims 2, 3, 5, 8, 9 and 27-28 stand rejected under 35 USC §102(e) as anticipated by U.S. Patent 6,163,573 to Mihara (hereinafter "**Mihara**").

Applicants respectfully traverse this rejection.

Mihara discloses an apparatus and method for repeatedly performing compression and encoding of video data, automatically detecting a previous picture type at an encoder side and performing the compression and encoding by matching GOP phases.

A motion compensation unit **240** to a DCT unit **244** performs motion compensation, DCT, etc., on input video data to generate DCT coefficients. A back search unit **248** detects whether or not there is a relative minimum in the sum of remainders of the results of division by the quantization steps of the DCT coefficients, judges that the picture having the relative minimum has been compressed and encoded to an intra-picture in the previous compression and encoding, and judges the structure of the GOPs (a number N of pictures and an interval M of P pictures) at the previous compression and encoding. A picture type control unit **250** controls a picture rearrangement unit **200** based on the judged GOP structure to make it rearrange pictures of the input video data to an order by which a compression and encoding unit **20** can perform compression and encoding with the same GOP phase as that of the previous time.

In **Mihara**, after previously compressed and encoded video data (A) is expanded and decoded (B), the expanded and decoded video data is compressed and encoded again (C) by

matching an encoding picture type of the second compression and encoding with an encoding picture type of the previous compression and encoding of the video. Accordingly, the data (B) is analyzed so as to synchronize the picture type of (A) with the picture type of (C).

Mihara discloses a system of analyzing information of (B) to specify or determine I picture (intra-picture) in (A). Mihara also discloses determination of pictures (P picture, B picture) other than the I picture from (B). However, these pictures are not determined only by the information of (B), but also by characteristics of encoders and decoders used in generating (A) and (C) and an interval of the I picture. **Mihara** does not disclose a detailed method of actually determining P and B pictures moreover.

On the other hand, according to the present invention, I, P and B picture in each of the input video data are determined by only analyzing motion characteristics of input video data per se to improve an encoding efficiency.

The Examiner urges that **Mihara** discloses determination of a total number N of pictures in the GOP (i.e., interval of I pictures) (**Mihara**, column 11, lines 6 to 11), but not an interval of P frames. The Examiner has also pointed out that **Mihara** discloses a method of determining a P picture (**Mihara**, column 11, lines 12 to 20). In the description of **Mihara**, column 11, lines 12 to 20, it can be judged not only the total number N of pictures in the GOP obtained from analyzed video data information, but also the structure of the GOP (combination of I, P and B pictures) corresponding to the total number of pictures in the GOP used by encoders 2a, 2b and decoders 4a, 4b of the system. However, this determining method is not specifically disclose.

The Examiner has urged that **Mihara** only describes analyzing of quantization which is

used by input decoded video image in the previous encoding (**Mihara**, column 9, line 65 to column 10, line 9). However, **Mihara** does not disclose that input video data is analyzed to determine the interval of I pictures and the interval of P pictures, as recited in claim 2 of the instant application.

As stated above, the Examiner urges that **Mihara** discloses a the method of determining the interval of I pictures depending on characteristics of input video data; and determining the interval of P pictures by combining the interval of I pictures obtained from the foregoing method and characteristics of encoders and decoders used in the system.

Accordingly, the present invention and **Mihara** are analogous only insofar as **Mihara** discloses a means for determining the interval of P pictures. However, the method of determining the interval of P pictures in **Mihara** does not utilize the motion characteristics of input video data per se, but rather the interval of I pictures obtained from analysis of the input video data and information of encoders and decoders included in the system.

Accordingly, claim 2 has been amended to recite this distinction.

The Examiner has cited column 10, line 63 to column 11, line 5 for disclosing inter-frame variance calculation means for calculating a variance between timewise adjacent frames with respect to the input video signals, as recited in claims 3 and 27:

> The back search unit **248** can decide whether or not the encoder **2** intra-coded an intra-picture of the input video data by deciding whether or not there is a conspicuous relative minimum in the sum of remainders of the DCT coefficients, for example, whether or not the ratio of the sum of remainders of the DCT coefficients found by the back search processing in the back search unit **248** with respect to the sum of remainders where the DCT coefficients are

> divided by the quantization step indicated by the quantization index input from the prediction unit **246** becomes less than a certain constant threshold.

Applicants respectfully disagree with the Examiner. The above passage fails to disclose the inter-frame variance calculation means recited in claims 3 and 27 of the instant application.

The Examiner has cited column 9, line 65 to column 10, line 9, for disclosing that the P frame interval decision means divides the input video picture into small blocks and carries out simple motion compensatory prediction by the use of a representative value per small block so as to decide the P frame interval, as recited in claim 8:

> That is, the back search unit **248** divides the DCT coefficients input from the DCT unit **244** via the prediction unit **246** by the quantization step indicated by the quantization index predicted by the prediction unit **246** and the value near this and, when there is a quantization step giving a sum of remainders of the result of division of a considerably small value, judges the quantization step indicating this considerably small value as the quantization step used in the previous compression and encoding and outputs the quantization index indicating this quantization step to the quantization unit **210**.

Applicants respectfully disagree with the Examiner. This passage fails to disclose dividing the input video picture into small blocks to carry out simple motion picture compensatory prediction by use of the representative value per small block, as recited in claim 8 of the instant application.

Thus, the 35 USC §102(e) rejection should be withdrawn.

Claims 2, 3, 5, 7-13 and 27-29 stand rejected under 35 USC §103(a) as unpatentable over **Kato et al.** (previously applied) in view of U.S. Patent 5,742,351 to Guede (hereinafter

"**Guede**").

Applicants respectfully traverse this rejection.

Kato et al. discloses means for deciding a coding mode of a block on a video picture, but fails to disclose means for deciding a coding mode of an entire video picture, as in the present invention.

For example, **Kato et al.** discloses whether or not each block on the video picture is coded in an intra-frame. However, **Kato et al.** fails to disclose whether or not a coding mode on the entire video picture is coded in an intra-frame. The intra-frame coding mode in a block unit is quite different from the intra-frame coding mode in a video picture unit. For example, in the former case, the intra-frame coding mode is selected in a block unit, however, in the latter case, all blocks are designated as an intra-frame coding mode.

For example, at column 6, lines 52 to 57 of **Kato et al.**, there is a description of "intra-f rame/f orward/backward/bi-directional prediction in terms of block as a unit...". This means that the coding mode for each block is decided.

According to the forward, backward and bi-directional mode prediction in **Kato et al.**, it is indicated that a prediction mode is adaptively selected in a block unit (column 4, lines 33 to 35). It is clear that this does not decide a distance between P frames.

Marks 11 and 12 in Fig. 3 of **Kato et al.** show motion vector detecting means and a frame memory, respectively (column 4, lines 33 to 35). However, these marks do not show a means for deciding a GOP boundary position. **Kato et al.** does not disclose a control means whereby a GOP

becomes variable, as the present invention.

The Examiner has admitted that **Kato et al.** fails to teach a GOP boundary position being decided based on the decision by the intra-frame coding mode decision means, and the P frame interval inside a GOP being decided based on the decision by the P frame interval decision means as specified in claims 2, 3, and 27, but has cited **Guede** for teaching this feature.

Applicants respectfully disagree.

Guede discloses a device for encoding sequences of frames constituted by video-type images of a first frequency (for example, 30 Hz) and film-type images whose original frequency is lower than this first frequency (for example, 24 Hz) and which are converted by means of the "3:2 pulldown" technique. The encoding device comprises a circuit for detecting the sequences of film-type images from the stream of input data, and a device for preprocessing these sequences for realizing an inverse conversion of the frequency by eliminating, before encoding, the redundant information introduced by the use of the "3:2 pulldown" method.

FIGS. 3 and 8 show no more than various GOP formats and an MPEG encoding device and fails to teach, mention or suggest the P frame interval inside the GOP being decided based on the decision by the P frame interval decision means, as recited in independent claims 2-3 and 27 of the instant application.

Thus, the 35 USC §103(a) rejection should be withdrawn.

Claims 14-16 stand rejected under 35 USC §103(a) as unpatentable over **Kato et al.** in view of **Guede** and further in view of **Igarashi et al.**

Applicants respectfully traverse this rejection.

As noted in Applicants' response of February 3, 2003, the Examiner has cited Fig. 32 of **Igarashi et al** for teaching that the small blocks (Fig. 10A-10B) are used to judge an edge region inside the video picture based on the dispersion value of pixel information of edges in a picture due to motion is detected by "var 1".

Applicants respectfully disagree. The terms "var 1" and "var 2" in Fig. 32 of **Igarashi et al.** represent variables, not variances. Fig. 32 and column 29, lines 1 to 47 of **Igarashi et al.** illustrate an operation for detecting a comb deformation of edges in a picture due to motion, as shown in Fig. 2, and mode changing (a first structure mode, a second structure mode) thereby. An object of the calculation of var 1 is to detect a portion (a comb deformation of edges in a picture due to motion) showing a characteristic as shown in Fig. 2 of **Igarashi et al.**, but the object thereof is not to detect an edge.

Thus, **Igarashi et al's** teaching of detecting comb deformation of edges in a picture due to motion does not teach or suggest "dividing a target video picture into small blocks so as to judge an edge region inside the video picture based on the dispersion value of pixel information on the small block," as recited in claims 14-15 of the instant application.

Thus, the 35 USC §103(a) rejection should be withdrawn.

In view of the aforementioned amendments and accompanying remarks, claims 2, 3, 5, 7-16 and 27-29, as amended, are in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants undersigned attorney at the telephone number

indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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